

**REMARKS/ARGUMENTS**

In the Office Action mailed February 25, 2004, claims 1, 4, 6-10, 14-24, 28-31, 33-45 and 49-59 were rejected under 35 U.S.C. § 112, second paragraph, and were also rejected under 35 U.S.C. § 103(a) over *Unger* in view of *Chan* and *Duffy*, *Figеys I* and *II* (either 1998 Analytical Chemistry article), *Parce* (US 5,885,470), *Ullman* or *Xue* (1997) and *Ericson* (newly cited and applied).

Claims 1, 14, 15, 18, 31, 37, 49, 52 and 58 are amended to address the rejections under § 112, second paragraph, and claims 1, 4, 6-10, 14-17, 23, 24, 30, and 59 have been amended to correct clerical errors and further clarify the claims. No new matter is added by the amendment, and claims 1, 4, 6-10, 14-24, 28-31, 33-45 and 49-59 are pending in the application. Reconsideration and withdrawal of the rejections is respectfully requested in light of the amendment and remarks which follow.

**A. The Rejection of the Claims under § 112, Second Paragraph**

The rejection of claims 1, 4, 6-10, 14-24, 28-31, 33-45 and 49-59 under 35 U.S.C. § 112, second paragraph is made moot by the amendment. Claim 1 is amended to remove "said second elastic layer", and recite "a pump and valve system coupled to the pressure channel". *See, e.g.*, the specification on page 11, lines 3-18, which describes how the opening and closing of pump and/or valve systems act to open and close the pressure channels. Claims 18, 31, and 37 are also amended to describe the coupling of the pressure channel in the second elastic layer to the pump and valve system.

Claims 14 and 15 are amended to depend from claim 1, and claim 14 is further amended to remove "said sample interface means" terminology. Claim 49 is amended to provide antecedent basis for the sample preparation chamber. Claim 52 is amended to list elements (i)-(xi) in the alternative by replacing "and" with "or". Finally, claim 58 is amended to depend from

claim 37, and clarify that the microfluidic device itself may comprise "a plurality of sample preparation chambers which are integrated with said fluid flow channel."

The amendment to claims 1, 14, 15, 18, 31, 37, 49, 52 and 58 address all grounds for the rejection of the claims under 35 U.S.C. § 112, second paragraph. Accordingly, withdrawal of the rejection of claims 1, 4, 6-10, 14-24, 28-31, 33-45 and 49-59 under § 112, second paragraph, is respectfully requested.

B. The Rejection of the Claims under § 103(a) Over the *Unger* Combination

Claims 1, 4, 6-10, 14-24, 28-31, 33-45 and 49-59 were rejected under 35 U.S.C. § 103(a) over *Unger* in view of *Chan* and *Duffy*, *Figeys*, *Parce*, *Ullman* or *Xue*, and *Ericson*. This rejection is respectfully traversed because the combination of references does not include every element of the claimed invention.

*Unger* (as well as *Duffy*, *Parce*, and *Ullman*) does not describe or suggest using the microfluidic device described therein for introducing a sample into an analytical device, as recited in independent claims 1, 18, 31, and 37. *Chan*, *Figeys I* and *II*, and *Xue* all describe complete systems that use electroosmotic or external pumping systems for moving samples through the microfluidic device, which are different mechanisms than used by *Unger* for controlling fluid flow. In particular, none of them describe or suggest integration with a microfluidic device having a second elastic layer on top of the first elastic layer, where the second elastic layer includes a pressure channel that forms part of a pump and valve system within the layer for controlling the flow of fluid within the fluid flow channel, also as recited in claims 1, 18, 31, and 37. This fundamental difference in how fluid flow is controlled makes the systems of *Chan*, *Figeys I* and *II*, and *Xue* incompatible with the systems of *Unger*, *Duffy*, *Parce*, and *Ullman*, as implicitly acknowledged by the Office Action's new reliance on *Ericson*.

But *Ericson* also only describes external pumping systems (*i.e.*, electrostatic and external pressure-driven systems), that are separate from the microchip, to move the sample through the microchip. The Office Action's proposed combination is not even possible using *Ericson*, because the microchip fluid channels are made from hard quartz etched with hydrofluoric acid.

For at least this reason, claims 1, 18, 31, and 37 are allowable over the references. Likewise, claims 4, 6-10, 14-17, 19-24, 28-30, 33-36, 38-45, and 49-59, which depend from one of claims 1, 18, 31, and 37, are allowable over the references for at least the same reason. Accordingly, withdrawal of the rejection of claims 1, 4, 6-10, 14-24, 28-31, 33-45 and 49-59 under 35 U.S.C. § 103(a) over *Unger* in view of *Chan* and *Duffy*, *Figeys*, *Parce*, *Ullman* or *Xue*, and *Ericson* is respectfully requested.

### CONCLUSION

In view of the foregoing, Applicants believe all claims now pending in this Application are in condition for allowance. The issuance of a formal Notice of Allowance at an early date is respectfully requested.

Please charge Deposit Account No. 24-1430 \$1175.00 for (1) a petition for revival of an application for patent abandoned unintentionally under 37 C.F.R. § 1.137(b), and (2) a petition for a three-month extension of time under 37 C.F.R. § 1.136(a). Should any additional fees be required, please charge the above-identified deposit account for any fee deficiency.

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Reply to Office Action of February 25, 2004

PATENT

If the Examiner believes a telephone conference would expedite prosecution of this application, please telephone the undersigned at 303-571-4000.

Respectfully submitted,



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